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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,893	02/27/2004	Albert Z.H. Wang	IIT-199	9292

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EXAMINER
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NGUYEN, TUYENT

ART UNIT	PAPER NUMBER
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2832

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/789,893

Applicant(s)

WANG, ALBERT Z.H.

Examiner

TUYEN T. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 28-42 is/are pending in the application.
- 4a) Of the above claim(s) 5,6,8,9 and 36-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,7,10-12,28-35 and 39-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of embodiment 1, figures 1-3 in the reply filed on 10/5/2005 is acknowledged. Claims 1-4, 7, 10-12, 28-35 and 39-42 will be examined herewith. Newly submitted claims 36-38 do not read on the elected species.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Lipkes et al. [US 5,945,920].

Lipkes et al. discloses an inductor comprising:

- a vertically stacked planar coils made from a plurality of spaced conductive layers [126]
- vias/connectors [122] connecting the plurality of spaced conductive layers; and
- a magnetic core structure disposed at a center of an extending perpendicular to each of the planar coils and comprising a plurality of vertically stacked and aligned magnetic elements [124].

Claims 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Klude et al. [US 6,480,086 B1] or Ushiro [US 5,552,756] or Lipkes et al. [see above].

Klude et al. discloses a spiral inductor [figures 3A-3B] comprising:

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- a plurality of planar coils [202a, 202b, 202c] disposed in a stacked and parallel orientation;

- a plurality of vias/connectors [figure 3A] electrically connecting the planar coils; and

- a magnetic core [215] extending perpendicular to and through a center of each of the planar coils.

Ushiro discloses a spiral inductor [figure 1] comprising:

- a plurality of planar coils [3, 4, 5, 6, 7, 8, 9, 10, 11, 12] disposed in a stacked and parallel orientation;

- a plurality of vias/connectors [3a, 4b, 5a, 5c, 6a, 6c, 7a, 7c, 8a, 8c, 9a, 9c, 10a, 10c, 11a, 11c, 12a] electrically connecting the planar coils; and

- at least one magnetic core [13a] extending perpendicular to and through a center of each of the planar coils.

Regarding claims 30-31, Lipkes discloses the claimed invention [see above].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4, 11-12, 28-29, 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkes et al. in view of Imam.

Lipkes et al. discloses the instant claimed invention except for the specific of the material of the magnetic core structure.

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Imam discloses a chip IC [figure 6, paragraph 3] comprising:

- an inductor coil [600]; and
- an electrically and magnetically core [640].

Imam discloses the use of CMOS technology [paragraph 27] and interconnecting pieces, winding pattern and core can be formed of the same material.

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to use CMOS technology and the same material for the connectors/vias and the magnetic core structure in Lipkes et al., as suggested by Imam, for the purpose of improving performance.

Regarding claims 11-12 and 40-41, the specific sizes, strength and materials used for the inductor would have been an obvious design consideration based on the desired inductance and cost parameters.

Regarding claims 28 and 32, the specific arrangement of the magnetic core structure would have been an obvious design consideration for the purpose of enhancing the magnetic flux.

Regarding claims 29 and 42, it would have been an obvious design consideration to include/connect the core structure to a core circuit for the purpose of completing the magnetic structure/loop.

Claims 7, 10 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkes et al. in view of Imam as applied to claims 1-4 above, and further in view of Abel [US 6,198,374 B1.

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Lipkes et al. in view of Imam discloses the instant claimed invention except for the specific additional magnetic layer.

Abel discloses an inductor formed of a plurality of magnetic layers [102-112] each including a coil pattern [122, 124, 126, 128], core piece [182, figure 4] and vias [169a-175f].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to use the inductor design of Abel in Imam for the purpose of enhancing magnetic coupling.

#### ***Response to Arguments***

Applicant's arguments with respect to claims 1-4, 7, 10-12, 28-35 and 39-42 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to TUYEN T. NGUYEN whose telephone number is 571-272-1996. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ELVIN ENAD can be reached on 571-272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TTN



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